09993708 '07130

FIG. 1

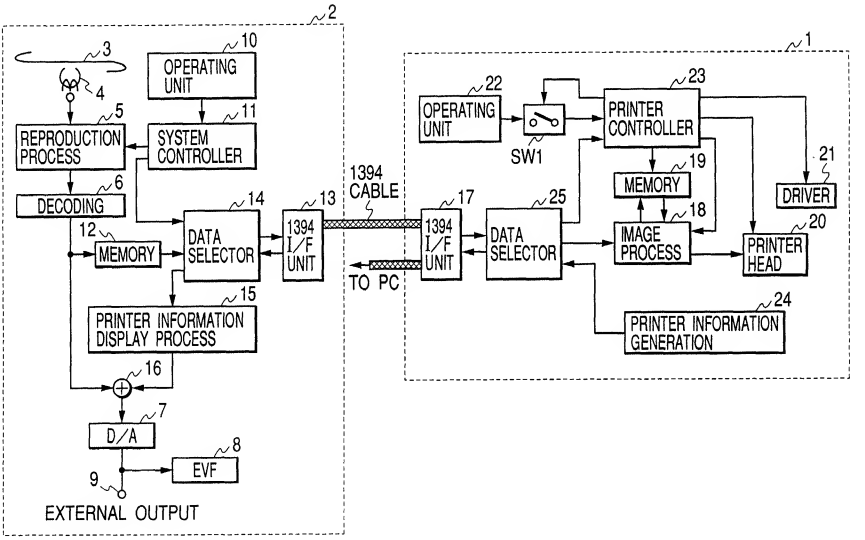


FIG. 2

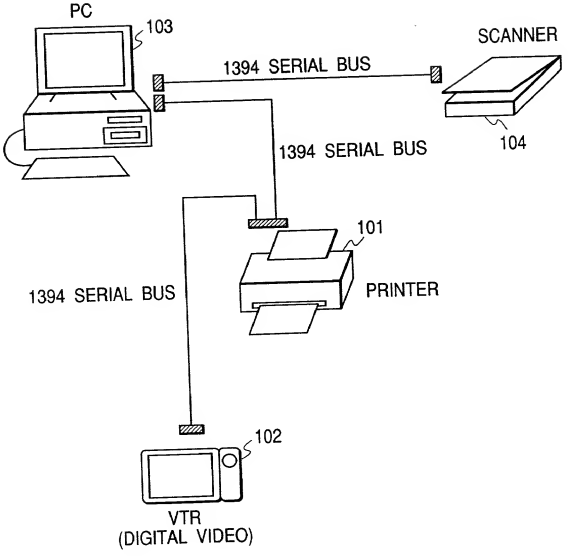
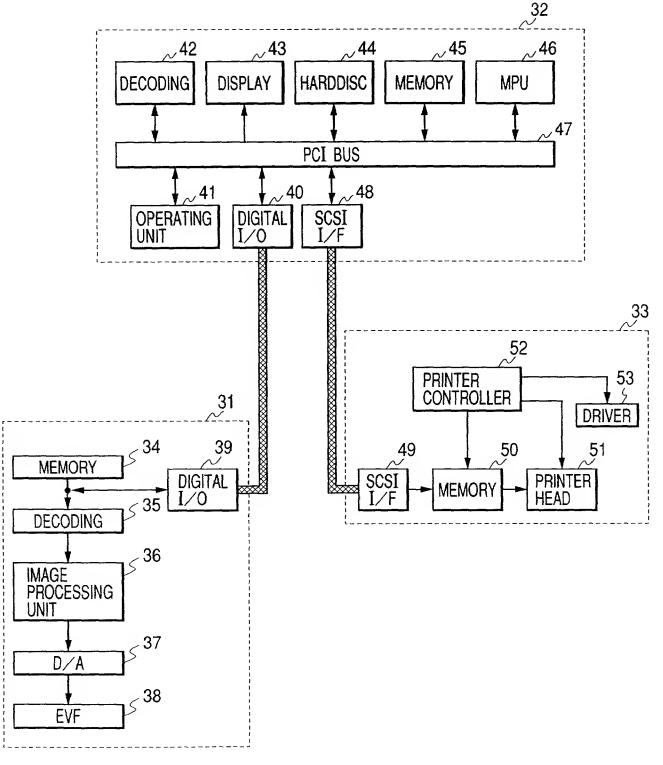

PC
103
SCANNER
1394 SERIAL BUS
104
1394 SERIAL BUS
101
1394 SERIAL BUS
PRINTER
102
VTR
(DIGITAL VIDEO)

FIG. 3


32
42
DECODING
43
DISPLAY
44
HARDDISC
45
MEMORY
46
MPU
47
PCI BUS
41
OPERATING UNIT
40
DIGITAL I/O
48
SCSI I/F
33
52
PRINTER CONTROLLER
53
DRIVER
49
SCSI I/F
50
MEMORY
51
PRINTER HEAD
31
34
MEMORY
39
DIGITAL I/O
35
DECODING
36
IMAGE PROCESSING UNIT
37
D/A
38
EVF

09903706 "07130A

FIG. 4

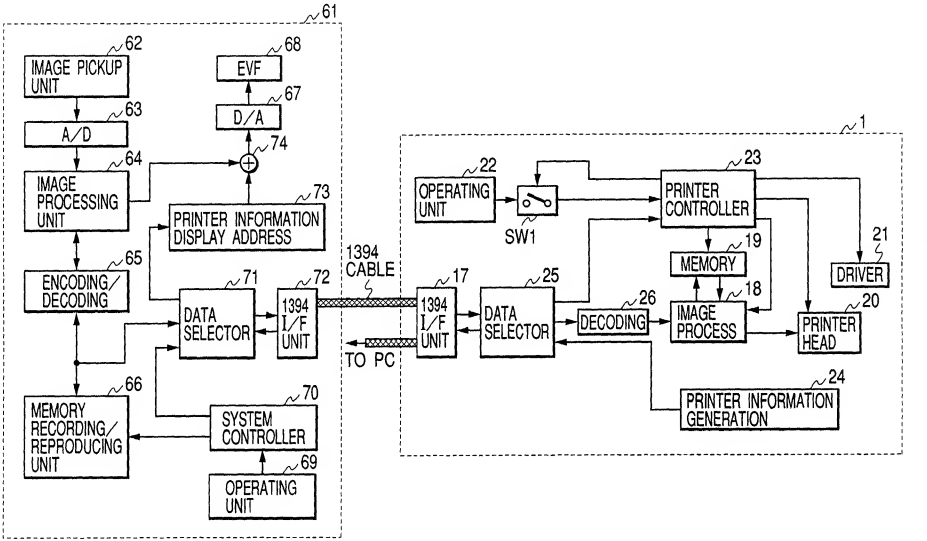


FIG. 5

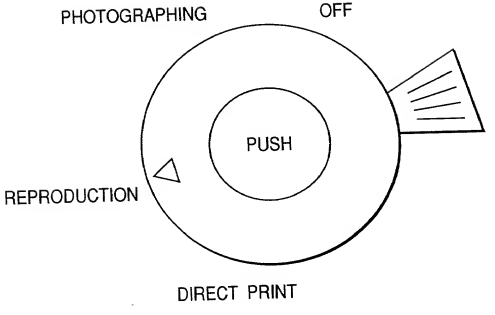


FIG. 6

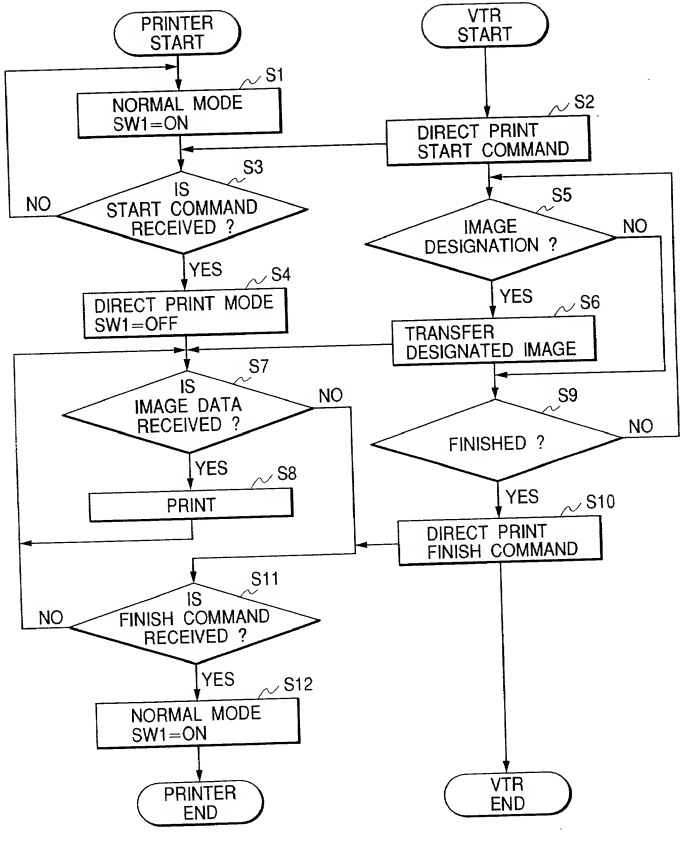

PRINTER START
VTR START
S1
NORMAL MODE SW1=ON
S2
DIRECT PRINT START COMMAND
S3
IS START COMMAND RECEIVED ?
NO
YES
S5
IMAGE DESIGNATION ?
NO
YES
S4
DIRECT PRINT MODE SW1=OFF
S6
TRANSFER DESIGNATED IMAGE
S7
IS IMAGE DATA RECEIVED ?
NO
YES
S9
FINISHED ?
NO
YES
S8
PRINT
S10
DIRECT PRINT FINISH COMMAND
S11
IS FINISH COMMAND RECEIVED ?
NO
YES
S12
NORMAL MODE SW1=ON
PRINTER END
VTR END

FIG. 7

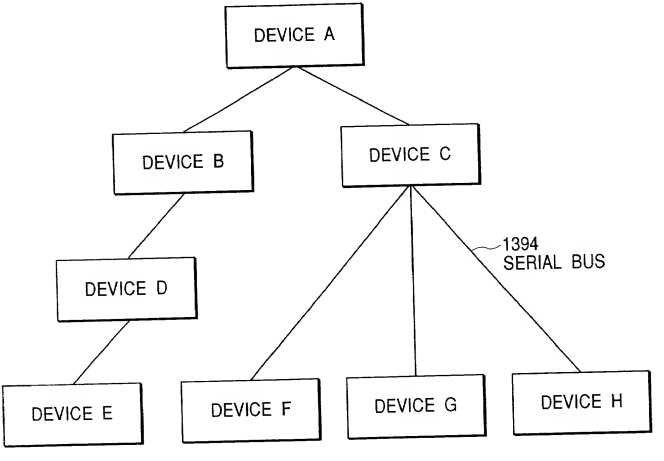

DEVICE A
DEVICE B
DEVICE C
DEVICE D
1394
SERIAL BUS
DEVICE E
DEVICE F
DEVICE G
DEVICE H

FIG. 8

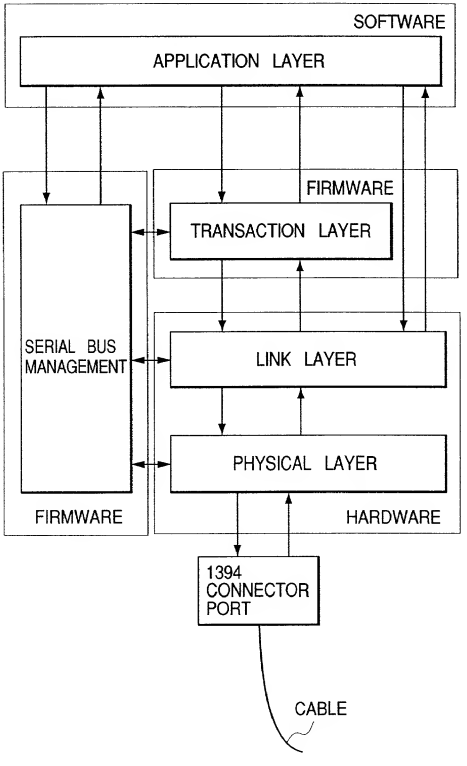

SOFTWARE
APPLICATION LAYER
FIRMWARE
TRANSACTION LAYER
SERIAL BUS MANAGEMENT
LINK LAYER
PHYSICAL LAYER
FIRMWARE
HARDWARE
1394 CONNECTOR PORT
CABLE

FIG. 9

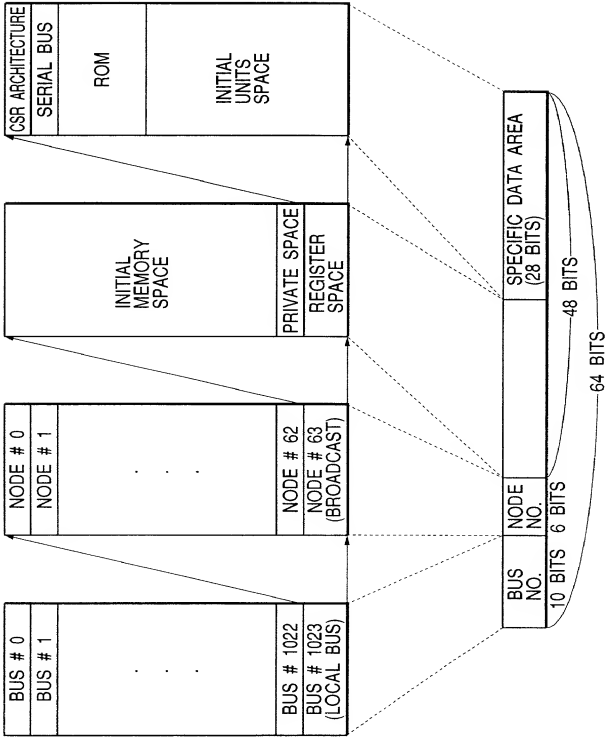

BUS # 0
BUS # 1
BUS # 1022
BUS # 1023 (LOCAL BUS)
NODE # 0
NODE # 1
NODE # 62
NODE # 63 (BROADCAST)
INITIAL MEMORY SPACE
PRIVATE SPACE
REGISTER SPACE
CSR ARCHITECTURE
SERIAL BUS
ROM
INITIAL UNITS SPACE
BUS NO.
NODE NO.
SPECIFIC DATA AREA (28 BITS)
10 BITS
6 BITS
48 BITS
64 BITS

FIG. 10

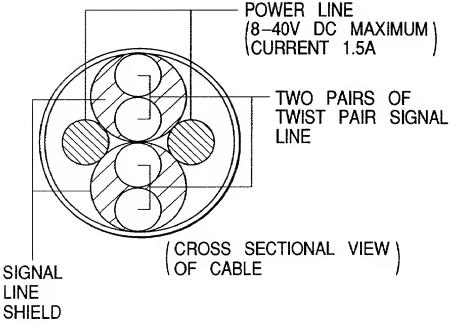
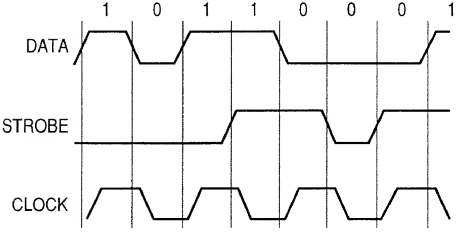
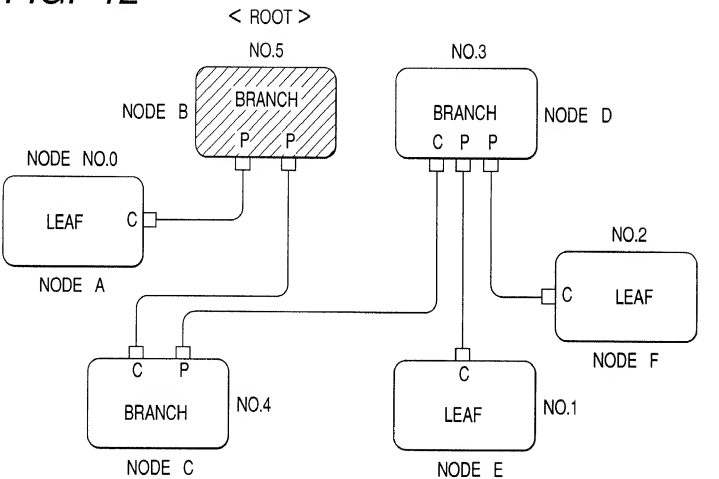

POWER LINE
(8–40V DC MAXIMUM
CURRENT 1.5A)
TWO PAIRS OF
TWIST PAIR SIGNAL
LINE
(CROSS SECTIONAL VIEW
OF CABLE)
SIGNAL
LINE
SHIELD

FIG. 11


1 0 1 1 0 0 0 1
DATA
STROBE
CLOCK

Patent Application Publication

FIG. 12



BRANCH : NODE CONNECTED TO AT LEAST TWO NODES
LEAF : NODE CONNECTED TO ONLY ONE PORT

□ : PORT
C : PORT CORRESPONDING TO CHILD NODE
P : PORT CORRESPONDING TO PARENT NODE

09903706 "07270

FIG. 13A

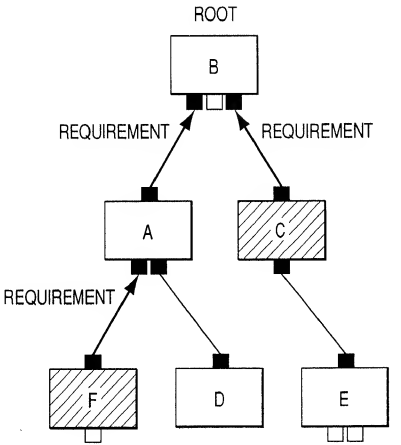
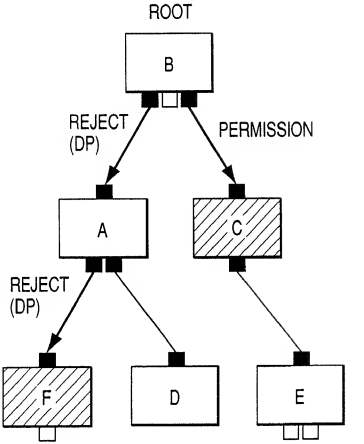
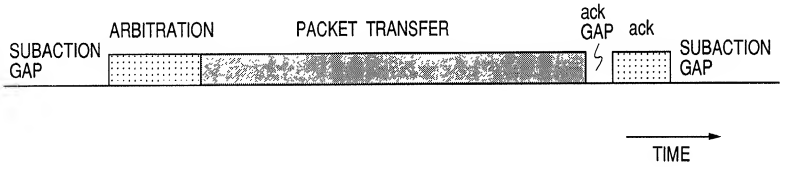


FIG. 13B



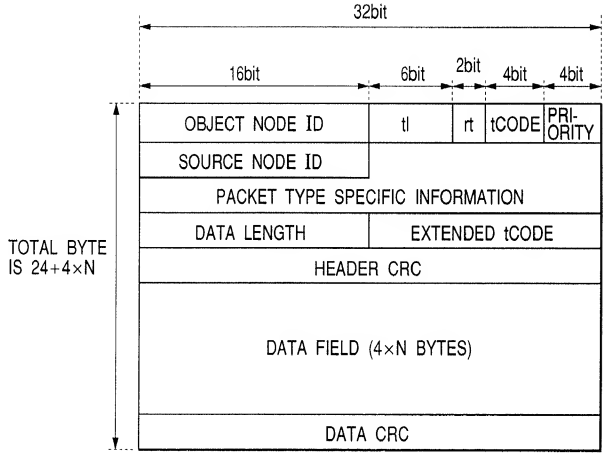
TOETZO" 90Z80660

FIG. 14



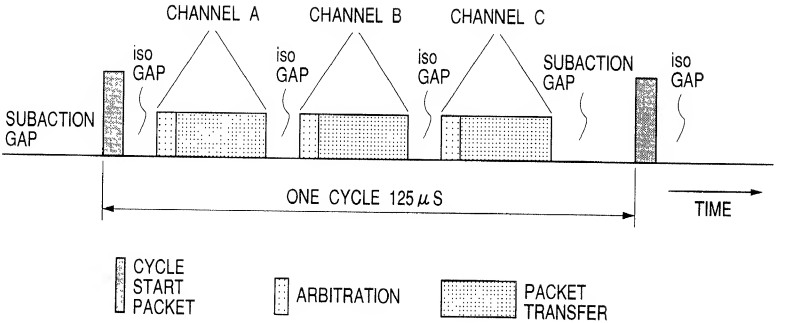
TOSTAR-3015660

FIG. 15



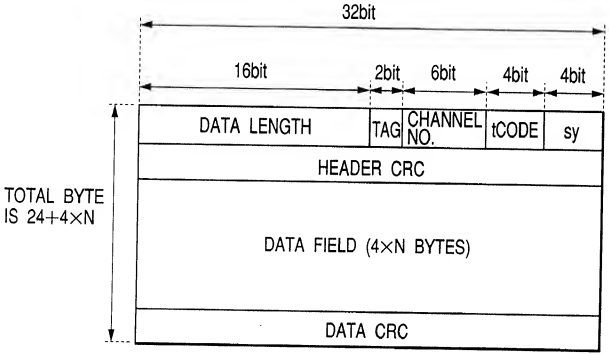
JP03237063

FIG. 16



09903706 "07301

FIG. 17



TOETZO"SOZZOGGO

FIG. 18

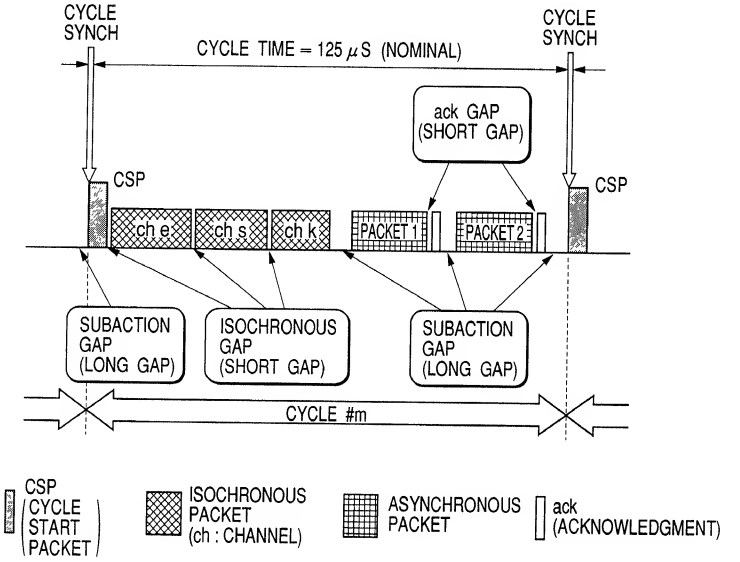


FIG. 19

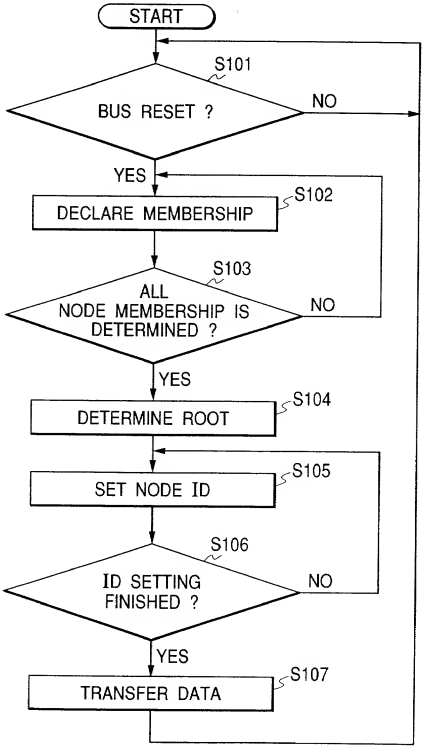

START
S101
BUS RESET ?
NO
YES
S102
DECLARE MEMBERSHIP
S103
ALL
NODE MEMBERSHIP IS
DETERMINED ?
NO
YES
S104
DETERMINE ROOT
S105
SET NODE ID
S106
ID SETTING
FINISHED ?
NO
YES
S107
TRANSFER DATA

FIG. 20

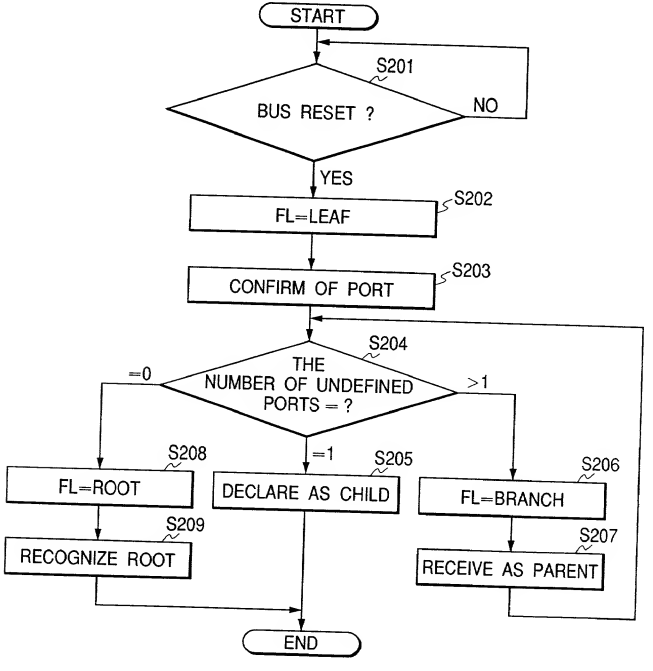

START
S201
BUS RESET ?
NO
YES
S202
FL=LEAF
S203
CONFIRM OF PORT
S204
THE NUMBER OF UNDEFINED PORTS = ?
=0
=1
>1
S208
FL=ROOT
S209
RECOGNIZE ROOT
S205
DECLARE AS CHILD
S206
FL=BRANCH
S207
RECEIVE AS PARENT
END

FIG. 21

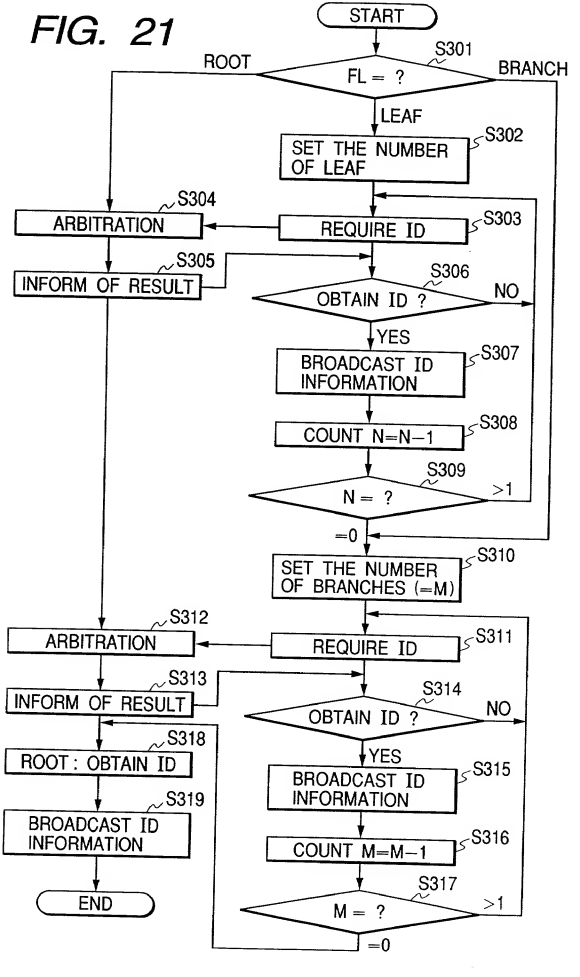

START
S301
FL = ?
ROOT
BRANCH
LEAF
S302
SET THE NUMBER OF LEAF
S304
ARBITRATION
S303
REQUIRE ID
S305
INFORM OF RESULT
S306
OBTAIN ID ?
NO
YES
S307
BROADCAST ID INFORMATION
S308
COUNT N=N−1
S309
N = ?
>1
=0
S310
SET THE NUMBER OF BRANCHES (=M)
S312
ARBITRATION
S311
REQUIRE ID
S313
INFORM OF RESULT
S314
OBTAIN ID ?
NO
S318
ROOT : OBTAIN ID
YES
S315
BROADCAST ID INFORMATION
S319
BROADCAST ID INFORMATION
S316
COUNT M=M−1
S317
M = ?
>1
END
=0

FIG. 22

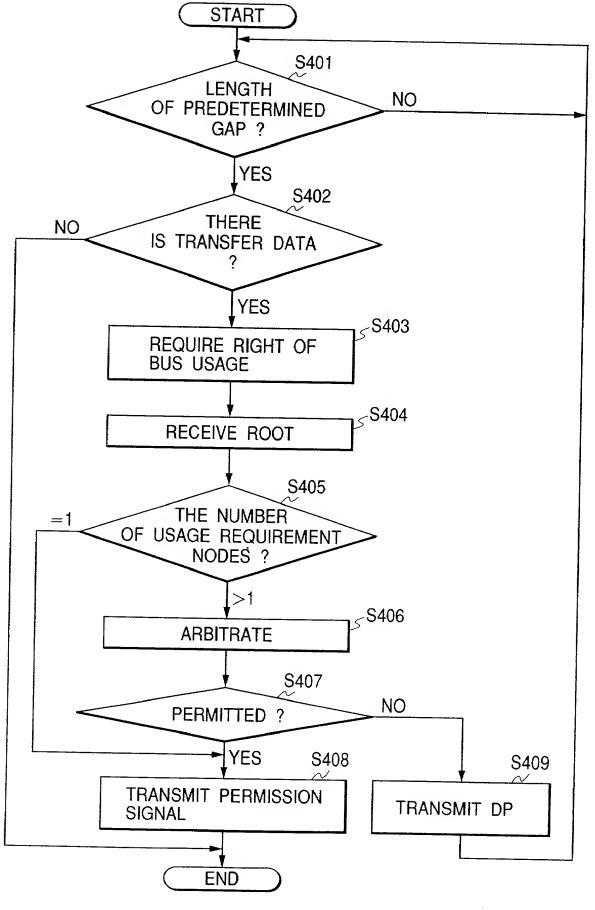

START
S401
LENGTH OF PREDETERMINED GAP ?
NO
YES
S402
THERE IS TRANSFER DATA ?
NO
YES
S403
REQUIRE RIGHT OF BUS USAGE
S404
RECEIVE ROOT
S405
THE NUMBER OF USAGE REQUIREMENT NODES ?
=1
>1
S406
ARBITRATE
S407
PERMITTED ?
NO
YES
S408
TRANSMIT PERMISSION SIGNAL
S409
TRANSMIT DP
END

FIG. 23

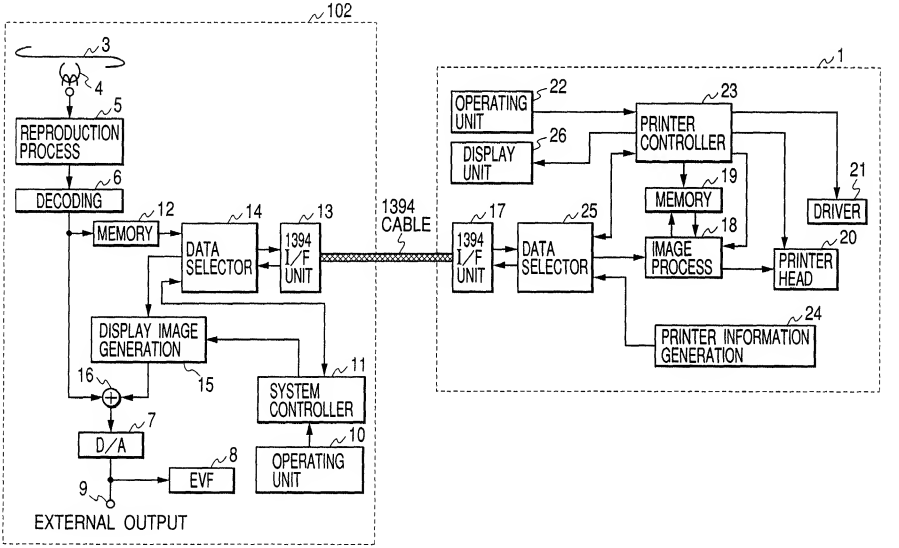

102
3
4
5
REPRODUCTION PROCESS
6
DECODING
12
MEMORY
14
DATA SELECTOR
13
1394 I/F UNIT
DISPLAY IMAGE GENERATION
16
15
11
SYSTEM CONTROLLER
7
D/A
8
EVF
9
EXTERNAL OUTPUT
10
OPERATING UNIT
1394 CABLE
1
22
OPERATING UNIT
26
DISPLAY UNIT
23
PRINTER CONTROLLER
19
MEMORY
21
DRIVER
17
1394 I/F UNIT
25
DATA SELECTOR
18
IMAGE PROCESS
20
PRINTER HEAD
24
PRINTER INFORMATION GENERATION

FIG. 24A

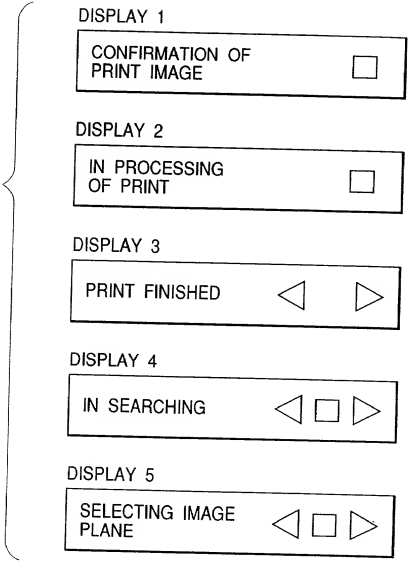


FIG. 24B

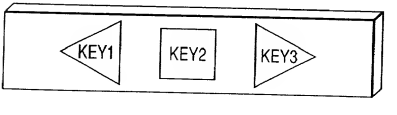


FIG. 25

FIG. 25A	FIG. 25B

FIG. 25A

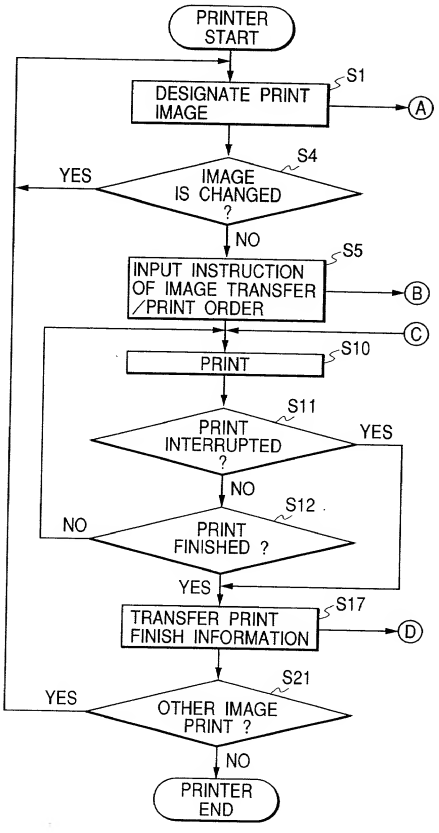


FIG. 25B

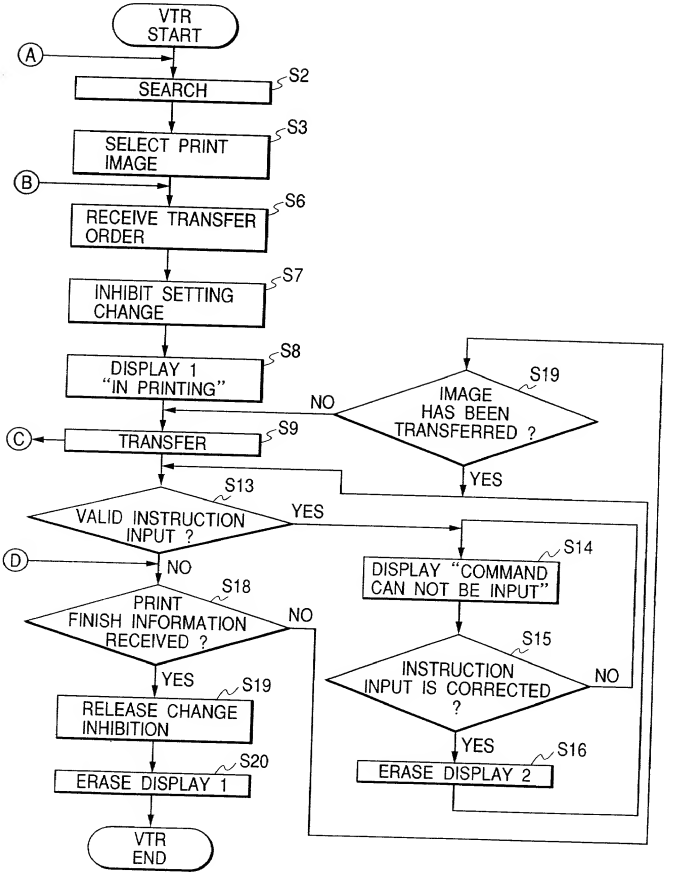

VTR START
A
SEARCH
S2
SELECT PRINT IMAGE
S3
B
RECEIVE TRANSFER ORDER
S6
INHIBIT SETTING CHANGE
S7
DISPLAY 1 "IN PRINTING"
S8
IMAGE HAS BEEN TRANSFERRED ?
S19
NO
YES
C
TRANSFER
S9
VALID INSTRUCTION INPUT ?
S13
YES
D
NO
DISPLAY "COMMAND CAN NOT BE INPUT"
S14
PRINT FINISH INFORMATION RECEIVED ?
S18
NO
INSTRUCTION INPUT IS CORRECTED ?
S15
NO
YES
RELEASE CHANGE INHIBITION
S19
ERASE DISPLAY 2
S16
ERASE DISPLAY 1
S20
VTR END

FIG. 26

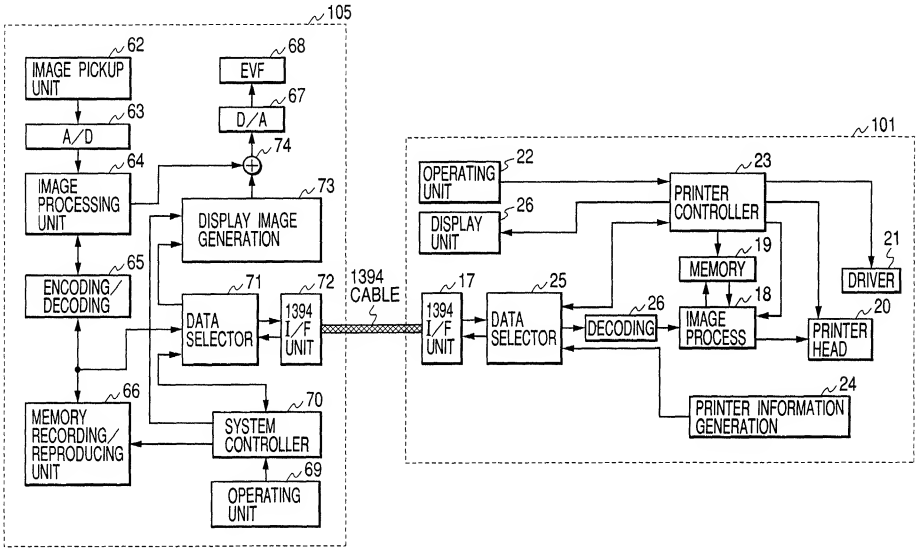

105
62
IMAGE PICKUP UNIT
63
A/D
64
IMAGE PROCESSING UNIT
65
ENCODING/ DECODING
66
MEMORY RECORDING/ REPRODUCING UNIT
68
EVF
67
D/A
74
73
DISPLAY IMAGE GENERATION
71
DATA SELECTOR
72
1394 I/F UNIT
70
SYSTEM CONTROLLER
69
OPERATING UNIT
1394 CABLE
101
22
OPERATING UNIT
26
DISPLAY UNIT
23
PRINTER CONTROLLER
19
MEMORY
21
DRIVER
17
1394 I/F UNIT
25
DATA SELECTOR
26
DECODING
18
IMAGE PROCESS
20
PRINTER HEAD
24
PRINTER INFORMATION GENERATION

FIG. 27

FIG. 27A	FIG. 27B

FIG. 27A

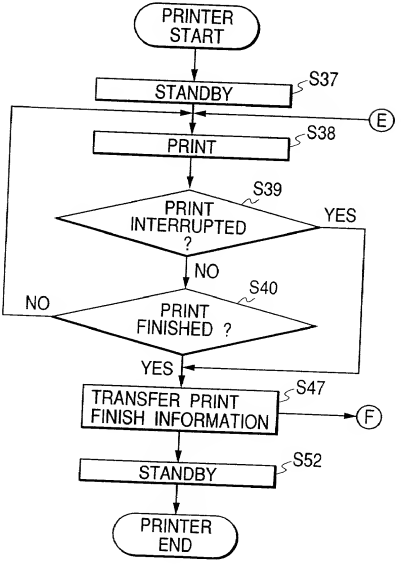
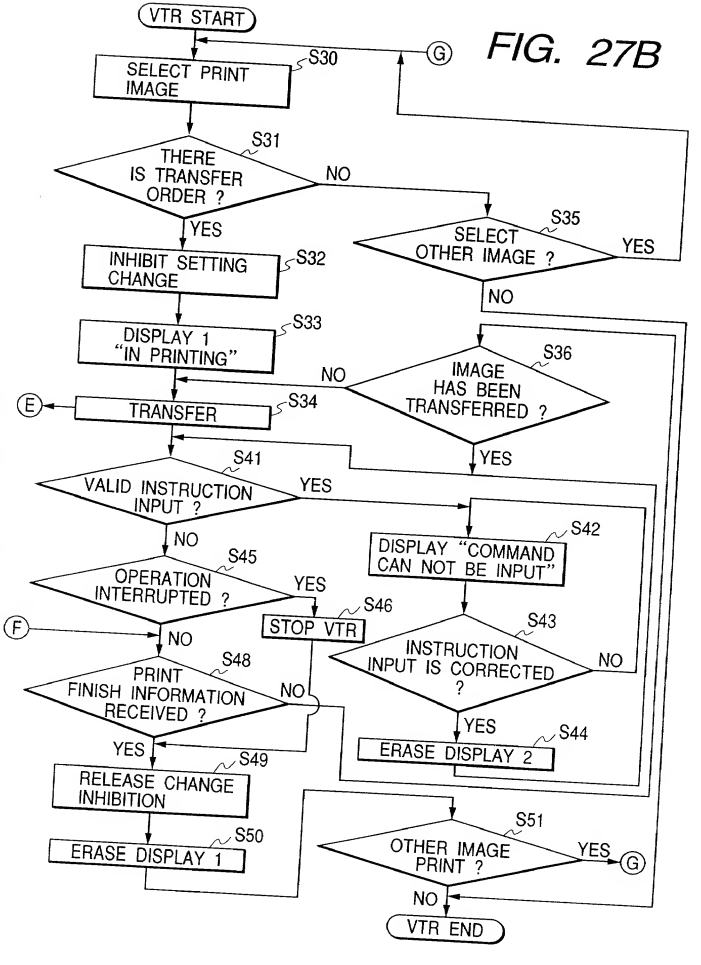


FIG. 27B


VTR START
SELECT PRINT IMAGE
S30
G
THERE IS TRANSFER ORDER ?
S31
NO
YES
SELECT OTHER IMAGE ?
S35
YES
NO
INHIBIT SETTING CHANGE
S32
DISPLAY 1 "IN PRINTING"
S33
IMAGE HAS BEEN TRANSFERRED ?
S36
NO
YES
E
TRANSFER
S34
VALID INSTRUCTION INPUT ?
S41
YES
NO
DISPLAY "COMMAND CAN NOT BE INPUT"
S42
OPERATION INTERRUPTED ?
S45
YES
F
NO
STOP VTR
S46
INSTRUCTION INPUT IS CORRECTED ?
S43
NO
YES
PRINT FINISH INFORMATION RECEIVED ?
S48
NO
YES
ERASE DISPLAY 2
S44
RELEASE CHANGE INHIBITION
S49
ERASE DISPLAY 1
S50
OTHER IMAGE PRINT ?
S51
YES
G
NO
VTR END